

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1 and 3-5 are currently being prosecuted. The Examiner is respectfully requested to reconsider his rejections in view of the amendments and remarks as set forth below.

Rejection Under 35 U.S.C. § 102

Claims 1 and 3-5 stand rejected under 35 U.S.C. § 102 as being anticipated by Kurosawa et al. (U.S. Patent 5,698,120). This rejection is respectfully traversed.

By way of the present Amendment, Applicants have amended claim 1 to include the limitations of claim 2, which was not included in this rejection. Accordingly, Applicants submit that this rejection has been overcome.

Rejection Under 35 U.S.C. § 103

Claim 2 stands rejected under 35 U.S.C. § 103 as being obvious over Kurosawa et al. in view of Jurca (U.S. Patent 5,272,312). This rejection is respectfully traversed.

Claim 2 has been cancelled and its limitations added to claim 1. Accordingly, this rejection will be considered in regard to claims 1 and 3-5.

The Examiner states that Kurosawa et al. shows a method of selection of a given field of observation in the region of the interactions between the laser beam and the work piece. Radiation is detected coming from the selected field of observation with the radiation sensitive receiver which delivers an electrical signal corresponding to the detected radiation. The electrical signal is filtered in order to be able to detect rapid and/or short fault-related changes and intensity of the detected radiation. The filtered electrical signal is evaluated for the detection of faults during a laser machining operation. The Examiner admits that Kurosawa et al. does not show a method using a stop arranged in front of the radiation sensitive receiver.

The Examiner relies on Jurca to show that it is known to provide a stop arranged in front of a radiation sensitive receiver for a laser welding apparatus. The Examiner feels that it would have been obvious to combine the stop of Jurca with the system of Kurosawa et al. for the purpose of providing an increase in the efficiency of the laser material processing.

Applicants submit that Jurca shows a process for the quality control of a laser beam welding and cutting that uses an IR-sensitive photo diode 8 arranged in a detector head and/or a detector protection housing 7 for receiving radiation from a plasma plume 3 which exists in the interaction zone between work piece 5 and laser focus 4. The interaction zone is imaged or projected by

a lens 10 onto the photo diode 8. In front of the lens, a shiftable aperture or stop 14 is arranged to prevent the projection of the welding pool that corresponds to the interaction zone from being projected on the IR-sensitive detector 8. The stop 14 is located between the lens 10 and the photo diode 8. However, since the field of observation is not projected onto the stop, but instead, is projected onto the photo diode, it is only possible to stop light from a certain region that is not intended to reach the photo diode. It is not possible to define a field of observation.

This differs from the present invention where the stop 11 and lens 14 can be moved in such a way that the field of observation can be shifted not only in the lateral direction, but also in the direction of the optical axis. Since this feature is not shown in either Kurosawa et al. or Jurca, Applicants submit that the invention as specified in claim 1 is not anticipated by either of the references or their combination.

In particular, claim 1 describes the step of projecting an interaction zone between the laser beam and the work piece onto the stop which is in front of the receiver in order to select the given field of observation. This differs from the Jurca reference where the field of observation is not projected onto the stop but instead is projected onto the photo diode. As a result, it is not possible to define the field of observation as is presently claimed. In

view of this, Applicants submit that claim 1 is not obvious over this combination of references.

Claims 3-5 depend from claim 1 and as such are also considered to be allowable. In addition, these claims have other features that make them additionally allowable. In particular, claim 4 discusses the high-pass filtering of the electrical signal. The Examiner refers to column 12, lines 3-7 of Kurosawa et al. to show this feature. However, Applicants disagree with the Examiner's understanding of the reference. Applicants submit that Kurosawa et al. has a low path filtering that removes short peaks from the output signal which can be seen by comparing Figs. 11(a) and 11(b) or Figs. 12(a) and 12(b) of the reference. Accordingly, Applicants submit that claim 4 is further allowable.

Conclusion

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied on by the Examiner, either alone or in combination. In view of this, reconsideration of the rejections and allowance of all the claims are respectfully requested.

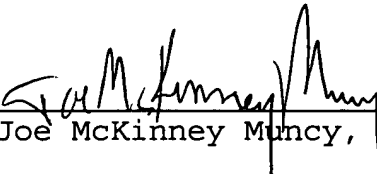
Pursuant to the provisions of 37 C.F.R. § 1.17 and § 1.136(a), Applicant hereby petitions for an extension of two (2) months in which to file a response to the outstanding Office Action. The required fee of \$225.00 is attached hereto.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert F. Gnuse (Reg. No. 27,295) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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